

Appl. No. 09/319,688
Amdt. dated November 26, 2003
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Amendments to the Claims:

Listing of Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Claims 1-11 (Canceled)

1 12. (Previously presented) A process for producing a fuel electrode of a solid
2 oxide fuel cell, each cell comprising a solid electrolyte layer, a fuel electrode disposed on one
3 surface of the solid electrolyte layer, and an air electrode disposed on an opposite surface, by
4 alternatively laminating a plurality of cells, adjacent cells being electrically connected to each
5 other, and a plurality of separators for distributing fuel gas to the fuel electrode of each cell and
6 oxidizing gas to the air electrode, comprising the steps of: adding a solution of a metallo-organic
7 compound of yttrium (Y) and a solution of a metallo-organic transition-metal compound to a
8 solution of a metallo-organic compound of zirconium (Zr) to prepare a mixed solution of
9 metallo-organic compounds of Zr-Y-transition metal; mixing NiO powder and cerium oxide
10 powder containing a divalent or trivalent metal oxide dissolved therein to the mixed solution of
11 the metallo-organic compounds to prepare a slurry; and successively subjecting the slurry to
12 hydrolysis, polycondensation, pyrolysis, annealing and reduction to obtain a cermet comprising
13 yttria-stabilized zirconia (YSZ) containing a transition metal dissolved therein, nickel (Ni) and
14 cerium oxide containing a divalent or trivalent metal dissolved therein.

1 13. (Previously presented) The process for producing the fuel electrode of the
2 solid oxide fuel cell according to claim 12 wherein said transition metal is cerium (Ce).

1 14. (Previously presented) The process for producing the fuel electrode of the
2 solid oxide fuel cell according to claim 12 wherein said transition metal is titanium (Ti) or
3 praseodymium (Pr).

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1 15. (Previously presented) The process for producing the fuel electrode of the
2 solid oxide fuel cell according to claim 12 wherein said metallo-organic compound is a metallic
3 aliphatic acid salt.

1 16. (Previously presented) The process for producing the fuel electrode of the
2 solid oxide fuel cell according to claim 12 wherein said metallo-organic compound is a metallic
3 acetyl acetate complex.

1 17. (Previously presented) The process for producing the fuel electrode of the
2 solid oxide fuel cell according to claim 15 wherein said metallic aliphatic acid salt is a metallic
3 octylate.

1 18. (Previously presented) The process for producing the fuel electrode of the
2 solid oxide fuel cell according to claim 12 wherein said fuel electrode is formed on a solid
3 electrolyte by a screen printing process.

1 19. (Previously presented) The process for producing the fuel electrode of the
2 solid oxide fuel cell according to claim 12 wherein a volume fraction of the cerium oxide
3 containing the divalent or trivalent metal dissolved therein in said cermet is in the range of 1% to
4 70%.

1 20. (Previously presented) The process for producing the fuel electrode of the
2 solid oxide fuel cell according to claim 12 wherein a concentration of Ni in said cermet is in the
3 range of 20% to 95% as a volume fraction.

1 21. (Previously presented) The process for producing the fuel electrode of the
2 solid oxide fuel cell according to claim 12 wherein a concentration of the transition metal in YSZ
3 containing said transition metal dissolved therein is in the range of 1 mol% to 30 mol%.

1 22. (Previously presented) The process for producing the fuel electrode of the
2 solid oxide fuel cell according to claim 12 wherein a concentration of YSZ containing the

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3 transition metal dissolved therein in said cermet is in the range of 1% to 50% as a volume
4 fraction.

1 23. (Previously presented) The process for producing the fuel electrode of the
2 solid oxide fuel cell according to claim 12 wherein said divalent or trivalent metal oxide is one or
3 a combination of plural ones selected from the group consisting of BeO, MgO, CaO, SrO, BaO,
4 Sm₂O₃, Y₂O₃, La₂O₃, Gd₂O₃, Sc₂O₃, Pr₂O₃, Nd₂O₃, Eu₂O₃, Yb₂O₃, Dy₂O₃, and Ho₂O₃.

1 24. (Previously presented) The process for producing the fuel electrode of the
2 solid oxide fuel cell according to claim 12 wherein said cermet has a structure in which surfaces
3 of Ni particles and surfaces of cerium oxide particles containing the divalent or trivalent metal
4 dissolved therein are covered with YSZ containing said transition metal dissolved therein in a
5 form of thin films or fine particles.

1 25. (Previously presented) The process for producing the fuel electrode of the
2 solid oxide fuel cell according to claim 12 wherein said hydrolysis is performed using moisture
3 in air.

1 26. (Previously presented) The process for producing the fuel electrode of the
2 solid oxide fuel cell according to claim 12 wherein as materials of said cermet, cerium oxide
3 powder containing the divalent or trivalent metal dissolved therein, Ni powder and a metallic
4 octylate solution of Ce, Y and Zr are used, and YSZ fine particles containing the transition metal
5 dissolved therein are uniformly dispersed between the cerium oxide particles containing the
6 divalent or trivalent metal dissolved therein and the Ni particles.

1 27. (Previously presented) The process for producing the fuel electrode of the
2 solid fuel cell according to claim 26 wherein an average particle diameter of said Ni particles is 1
3 m or more, the average particle diameter of said cerium oxide particles containing the divalent or
4 trivalent metal dissolved therein is 1 m or more, and the average particle diameter of said YSZ
5 particles containing the transition metal dissolved therein is 1 m or less.

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1 28. (Withdrawn) A fuel electrode of a solid oxide fuel cell comprising a
2 cermet of yttria-stabilized zirconia (YSZ) containing a transition metal dissolved therein and
3 having electronic conductivity in a fuel electrode operating atmosphere and nickel (Ni).

1 29. (Withdrawn) The fuel electrode of the solid oxide fuel cell according to
2 claim 28 wherein said cermet has a structure in which Ni particles and YSZ particles containing
3 the transition metal dissolved therein are uniformly dispersed.

1 30. (Withdrawn) A fuel electrode of a solid oxide fuel cell comprising a
2 cermet of yttria-stabilized zirconia (YSZ) containing a transition metal dissolved therein and
3 having electronic conductivity in a fuel electrode operating atmosphere, nickel (Ni), and cerium
4 oxide containing a divalent or trivalent metal dissolved therein.

1 31. (Withdrawn) The fuel electrode of the solid oxide fuel cell according to
2 claim 30 wherein said cermet has a structure in which surfaces of Ni particles and surfaces of
3 cerium oxide particles containing the divalent or trivalent metal dissolved therein, uniformly
4 dispersed in the cermet, are covered with YSZ thin films or fine particles containing the
5 transition metal dissolved therein.

1 32. (Withdrawn) The fuel electrode of the solid oxide fuel cell according to
2 claim 30 wherein as materials of said cermet, cerium oxide powder containing a divalent or
3 trivalent metal dissolved therein, Ni powder and a metallic octylate solution of Ce, Y and Zr are
4 used, and YSZ fine particles containing the transition metal dissolved therein are uniformly
5 dispersed between the cerium oxide particles containing the divalent or trivalent metal dissolved
6 therein and the Ni particles.

1 33. (Withdrawn) The fuel electrode of the solid oxide fuel cell according to
2 claim 32 wherein an average particle diameter of said Ni particles is 1 μm or more, the average
3 particle diameter of said cerium oxide particles containing the divalent or trivalent metal

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- 4 dissolved therein is 1 μm or more, and the average particle diameter of said YSZ particles
- 5 containing the transition metal dissolved therein is 1 μm or less.